retained, not as a condition of copyright but for the purpose of keeping a complete record of national literary and artistic achievement. The publisher, who must in any case furnish the Copyright Office with proper evidence that each publication was manufactured in the United Staes, is asked at the same time to deposit two copies with the Copyright Office. This arrangement is believed to incur no hardship upon anybody.

Statutory damages, much revised, are retained as a deterrent to infringement. This principle has been characteristic of every copyright law in the United States since 1790; in addition, however, the right to sue for statutory damages, under the provisions of the new bill, is dependent upon the fulfillment of all acts prescribed therein, or, to put it the other way, failure to fulfill the provisions of the bill automatically deprives the delinquent of his rights to statutory damages.

The bill that has been constructed upon these principles contains a number of new provisions: for example, it specifies among the non-infringing uses of copyrighted works the conditions under which libraries and individuals may use microcopy or other photographic process for the copying of manuscripts or of books no longer available for purchase. New techniques or new methods of diffusion are recognized and special provisions are made for non-infringing uses in relation to depicting or broadcasting public scenes or news events. The section on alien authors has been carefully rewritten, and includes extended jurisdiction of the presidential proclamation in international copyright matters. The manufacturing requirements for foreign English language works eliminate the old *ad interim* clause and set a generous importation quota for a trial sale edition. If the author or other owner imports more than the 500 printed copies permitted, in addition to the sales to libraries and certain other individual exceptions, the punishment is loss of protection for the right that has infringed the regulation; all other rights are retained.

Space prevents further summary of the content of S.3043. It is published in full in the *Congressional Record* of January 8, 1940, pages 134–49.

WALDO G. LELAND

AMERICAN COUNCIL OF LEARNED SOCIETIES

TYPES OF ANIMAL REFLEXES

THE usual type of reflex mechanism in animals consists of an afferent nerve path extending from a sense organ to some part of the central nervous apparatus whence an efferent nerve path leads to an outlying effector, commonly a muscle, gland or other like organ. This type of reflex mechanism, whose recognition dates from the days of Descartes, is well exemplified in the melanophore system of the catfish (Ameiurus) in which afferent nerve paths extend from the fish's eyes to its central nervous organs whence efferent nerve paths pass outward to the melanophores in its skin. This system is concerned with the reflex darkening of the fish which results from an expansion of its integumentary melanophores when, for instance, the fish is in a brightly illuminated, black-walled vessel.

Catfishes likewise become dark by means of a second system essentially independent of the one just described. When bright light falls on the skin of a catfish, it stimulates certain photoreceptors whereby impulses are generated that pass over the integumentary nerves to the central nervous organs where they reach the pituitary gland on the base of the brain. These impulses excite the discharge of one of the secretions of this gland, intermedin, which is then transported by the circulatory fluids of the fish, blood and lymph, from the place of origin to melanophores in the skin. Here the intermedin causes the melanophores to disperse their pigment and thus to darken the fish. This type of response is as truly reflex as the first one, but it differs from that one in having a humoral efferent arm in place of a nervous one. Its afferent arm, however, remains, as in the typical reflex, purely nervous. Such a reflex is thus easily distinguished by its humoral efferent component and may be designated in consequence of the sequence of its two components a neurohumoral reflex.

From the standpoint of humoral substitution a third type of reflex may be anticipated. In this the afferent arm would be humoral and the efferent nervous. As a matter of fact, such a reflex is to be seen in the respiratory organization of the higher vertebrates. Here the humoral afferent arm is represented by the stream of lymph and blood carrying carbon dioxide or other exciting metabolite from the animal's tissues to the respiratory center in its medulla oblongata. The nervous efferent arm in this reflex is the motor nerve connections between the medulla and the respiratory muscles. If the preceding example in consequence of the sequence of its components may be called neurohumoral this one for the same reason may be termed humeroneural. Thus, when neurohumors are taken into consideration, at least three types of animal reflexes can be distinguished, purely nervous, neurohumoral and humeroneural.

G. H. PARKER

HARVARD UNIVERSITY

NEW MATHEMATICAL LIBRARY OF INSTITUTE FOR ADVANCED STUDY

LAST fall the Institute for Advanced Study in Princeton, N. J., moved into a building of its own erected on its own grounds, called Fuld Hall. Up to

then the three departments (schools of mathematics, economics and politics and humanistic studies) had been scattered over the campus of the university and the town of Princeton.

The School of Mathematics of the Institute is devoted to research work in mathematics and theoretical physics. It consists of a permanent staff of six professors and one associate, their assistants and a varying number of temporary members, both from this country and abroad, some of whom receive stipends from the Institute.

The new building provides office space for the permanent and temporary members, room for the collections of the humanistic school and space for a research library. The School of Mathematics has started to build up its own library, which is intended to cover both mathematics and mathematical physics, and is prepared to buy second-hand books and sets of periodicals from private owners and duplicates from other libraries. Offers addressed to The Library, Institute for Advanced Study, Princeton, N. J., will receive careful consideration.

HERMANN WEYL

INSTITUTE FOR ADVANCED STUDY,
PRINCETON, NEW JERSEY

RECORD OF CHEMICAL PROGRESS

COPIES of the January, 1939, issue of the *Record of Chemical Progress* were sent to members of Section C of the A.A.A.S. because they contained preprints of the papers to be given at the Richmond meeting. There is an unusual demand for this issue; hence, any copies returned to the secretary will be deeply appreciated, and postage will be refunded.

NEIL E. GORDON

CENTRAL COLLEGE,
FAYETTE, MO.

SCIENTIFIC BOOKS

ENGLISH DIET

The Englishman's Food; A History of Five Centuries of English Diet. B. J. C. DRUMMOND and ANNE WILBRAHAM. 574 pp. with appendix. London: Jonathan Cape.

THIS book represents an attempt, according to the authors, "to present a picture of the changing character of the English diet during the past five centuries against a background of social and economic history." As such, it is unique among histories of nutrition. It is dedicated to William Stark (1740–1770), a martyr to the experimental study of foods, himself as subject (p. 286). It is of interest to American readers to learn that Stark "was diverted from anatomical studies with John Hunter to the study of the functions of foods as the result of a chance conversation with Benjamin Franklin, who at the time was in London on one of his political missions." This is but a sample of the wealth of interesting historical detail to be found in this book.

The outline of the book in 5 parts and 25 chapters is in the main chronological, but the historical journey is interrupted by pleasant interludes dealing with modern concepts of nutrition. For example, in discussing diet and health previous to the seventeenth century, it is noted that for the English peasant a great deal depended on the amount of "white meats," *i.e.*, milk, whey, cheese and eggs, which was eaten. Then follows an account of the recent experiments of Dr. Corry Mann on behalf of the Medical Research Council of Great Britain, showing the benefit of adding milk to the basic diet of a boys' institution, which provided rather small proportions of animal protein, fat and insufficient green vegetables. Further consequences of a diet lacking in dairy products in those times are discussed at this point in terms of vitamins.

Reviewing the seventeenth century writings of Burton ("Anatomy of Melancholy"), Samuel Pepys ("Diary"), John Evelyn ("Diary"), Thomas Muffet ("Health's Improvement"), Robert Boyle ("Medical Experiments") and others, the authors conclude that "all classes, rich and poor alike, were insufficiently protected against scurvy." An entire chapter (VII) is devoted to this disease at this point, particular attention being given to the origin of methods for its treatment. "All the evidence points to the English having learnt about scurvy from the Dutch sailors during the period of great voyages which started with Vasco de Gama's discovery of the West African Coast in 1498." Referring to the expedition of Jacques Cartier to the "backside of Newfoundland" in 1535 and the remarkable cure which he found for scurvy, the authors confute the opinion of Lind (1753) and others that it was a decoction of spruce tips which effected the cure, by recalling that Cartier's notes particularly refer to the fact that the "Indians had to wait for the leaves to appear in the spring." The tree, on the opinion of Dr. J. Gilmour, director of the Royal Botanic Gardens at Kew, was *Sassafras officinale.* The discussion of scurvy in this chapter and in Chapter XIV is the most enlightening historically known to the reviewer. The authors have brought to light many older writings bearing on the subject, ordinarily quite overlooked. Noteworthy is the little book entitled "Observationes circa Scorbutum," by Johannes Bachstrom, published at Leyden in 1743, which demolished all the complicated distinctions which had grown